STATEMENT OF ANTHONY J. BRODERICK, ASSOCIATE ADMINISTRATOR FOR REGULATIONS AND COMPLIANCE, FEDERAL AVIATION ADMINISTRATION, BEFORE THE SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION, SUBCOMMITTEE ON AVIATION, CONCERNING THE FAA'S PROPOSED EXIT ROW SEATING REGULATION. MARCH 14, 1989.

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to appear before the Subcommittee to describe the FAA's actions to prescribe guidelines to ensure that passengers seated near aircraft exits can facilitate an emergency evacuation. I know there are some concerns about our efforts in this area, and I welcome the opportunity to address those concerns today and Chairman Hollings' bill, the "Air Travel Rights for Blind Individuals Act."

Congress' enactment of the Air Carrier Access Act in 1986 prompted renewed attention to a critical issue of aviation safety--the ability to evacuate an aircraft cabin within seconds after a crash involving fire. These events are uncommon, but they must be planned for.

In a crash involving cabin fire, every small increment of time counts. When an evacuation is in full progress, it is typical to see maximum passenger evacuation rates of one per second down each aisle of each door slide. In a widebody aircraft, this can mean ten people evacuating each second! If an aisle-or, worse, a door leading to a double aisle slide--is blocked for a brief period,

say 10 seconds, this may prevent 10 or 20 people from evacuating the aircraft. With such large potential passenger flow rates and the real threat of fire and disasterous flashover present in every accident, I am sure you can see why a delay of even 5 or 10 seconds could be tragic and should be avoided if at all possible.

FAA research concerning aircraft evacuations--both from actual and simulated accidents--tells us that the most critical phase of an evacuation is the initial start up time--getting the doors or window exits open safely, deploying evacuation slides, beginning the movement of people off the airplane. Time lost during this initial part of the evacuation can never be made up, whereas, once the evacuation queues begin to form, time lost in getting to those lines is not as critical and can be compensated for. This means that, during an evacuation, anything which slows the opening of doors or impedes the start of passengers getting off the plane increases the likelihood of fatalities. Research also shows us that people with extra responsibilities--for example, the care of a small child--people with certain kinds of disabilities, and infirm, aged, or obese people, if seated near an exit, may impede rather than facilitate an evacuation from an aircraft. Simply stated, the possibility that such individuals may be seated in exit rows creates an added safety risk not only for themselves but for other passengers as well, and mandates FAA activity in this area. These studies were scientifically conducted by a team of

researchers, each utilizing his or her particular skill and training. Each member of the research team has published extensively. Each is widely-recognized.

To address this safety issue, FAA has just issued a Notice of Proposed Rulemaking that seeks to develop an approach which recognizes which functions and capabilities are needed to initiate both safe and timely evacuation from an aircraft exit. They include: locating the exit; recognizing, comprehending the instructions for use, and operating an exit door or window; assessing conditions, such as outside fires, distance to the ground, or hazards outside the exit; assessing whether a slide can be used safely; stowing or securing an exit door; safely using the exit, including facilitating or aiding other passengers; and following directions (either in the form of oral directions or hand signals) from a crewmember. A person's inability to perform adequately any of these functions could jeopardize the safety of other passengers.

I would like to set forth the background for our NPRM. For safety considerations, individual airlines have in the past adopted procedures which address transportation of handicapped people. Many of the airline procedures dealt specifically with exit row seating, and followed the general guidelines published by the FAA on air transportation of persons with disabilities. All of these

procedures were reviewed by the FAA to be sure they did not create safety problems, but they were never screened by the agency for consistency or standardization. Regulatory negotiation on rules implementing provisions of the Air Carrier Access Act clearly pointed out the need to specifically address the safety issues, as well as nondiscrimination issues, involved in exit row seating and to ensure that any procedures used by the airlines were reasonable, fair, and uniformly applied. Today, however, the traveling public is faced with a confusing and sometimes inconsistent array of different airline procedures.

Exit row seating can be critical to determining whether passengers will survive an aircraft accident involving fire. While we focus considerable attention during aircraft design and certification on ways to minimize fuel spillage and ignition following a crash, fire clearly can and does occur. A passenger's survival of a crash involving fire depends on his or her being able to evacuate and move quickly away from the aircraft in a short time, during the period I call the "window of survivability." The width of this window is measured in seconds, and may be as short as 30 seconds, up to 100 or 200 seconds or more, depending on the specific circumstances. In the past decade, FAA scientists, engineers and safety specialists from a number of disciplines have

conducted a wide variety of cabin safety and crash survivability programs. Viewed in a broad perspective, they all drive toward a common goal--opening the window of survivability as wide as possible, thus increasing the time available for evacuation of an airplane following a crash and assuring that as many passengers as possible can safely evacuate the airplane within that window.

The window of survivability begins the instant an aircraft comes to rest, when it is possible to initiate an evacuation. The window ends when cabin fire becomes so intense, or the air so poisoned, that survival is no longer possible. Most of our safety efforts in the past decade have been pointed towards pushing that time back--delaying the onset of intense cabin fire so that more time is available to evacuate safely. Indeed, many tens of millions of dollars have been spent by airlines to comply with a number of rules, each of which is designed to add a small increment of time to the window of survivability by delaying the onset of fire and toxic fumes. For example, airlines have added fire blocking layers to foam seat cushions. This eliminates an early source of fuel for cabin fires, thereby delaying the onset of flashover--the fireball which envelops the cabin and makes it non-survivable--and widening the window of survivability. High performance Halon fire extinguishers are now required in all aircraft, and the number of extinguishers has been increased. Much improved flight and cabin crew protective breathing equipment

has been mandated, and improved training is designed to provide more passenger escape time. Smoke detectors and automatic fire extinguishers have been added to lavatories, and fire hardened wall and ceiling panels are now required for all new aircraft interiors. Retrofit of these materials is being required as cabins are refurbished. As a direct result of 23 fatalities in the 1983 Air Canada fire, we added floor proximity lighting systems to our cabin safety requirements. By helping speed the evacuation process by means of better visual orientation and color coded identification of exit locations, most safety experts agree we have added another increment to the window of survivability.

Mr. Chairman, each of these actions has improved the survival aspects of an airline accident. Each is a small but very important increment in our safety programs. When we look at the potential for hundreds of deaths in an otherwise survivable fire, as happened inexplicably a few years ago in a foreign operated L-1011 accident; when we see the tragic loss of life caused by the onset of flashover in situations like the Air Canada accident or the 737 accident at Manchester, England, a few years ago; when we see the additive nature of each safety improvement we have made over the years, perhaps it becomes clear why we have focused so carefully on ensuring that evacuation is not slowed by the seating of people who generally are less capable of performing the functions required to initiate (or stop) the use of an emergency exit as soon as possible.

Exit row seating is not a new issue. In fact, in the early 1970's the FAA considered prescribing specific regulations in this area, finally opting, instead, to provide general guidance to carriers in the form of an FAA Advisory Circular and authorizing airlines to develop their own approach to restrict exit-row seating. Subsequently, though, there have been two developments which have caused us to focus again on this safety area. First, we have found that the approaches adapted by carriers have varied considerably and lack consistency. Consequently, the full benefits of our safety improvements may not be realized in the event of an emergency evacuation. We have also noted that most passengers are not aware of the requirements for quick, effective action by themselves to facilitate an evacuation. Second, section 382.31 of the Departmental NPRM, implementing the Air Carrier Access Act of 1986 proposes to allow carriers to restrict exit row seating only to the extent that it is necessary to comply with FAA safety requirements. These factors led us to conclude that we had to reassess our earlier approach in this area, with a view toward adopting whatever measures are necessary for safety.

The approach we are following is not intended, in any manner, to raise barriers to travel for any individuals or category of people and the proposed rule has been carefully crafted to be sure it does not have any such effect. To the contrary, our focus is only on exit rows where there is the clearest responsibility for people

to be able to initiate and facilitiate an emergency evacuation. Other locations in the aircraft would be unaffected by this approach, and the right to travel would be fully protected for all groups and individuals. People will not be denied the opportunity to fly because of this safety proposal.

Our intent is to prescribe the minimum requirements needed for the safety of all passengers, taking into account the kinds of abilities--whether sensory, physical, or cognitive--needed to get people off a threatened aircraft. It is a rule that will emphasize the ability of a person to perform critical safety-related functions and not the presence or absence of a disability.

We would expect, for example, that people whose age or infirm condition might impair their ability to open an exit would not be seated in an exit row. Similarly, persons with small children accompanying them would not be considered appropriate for exit row responsibilities as there is an expectation that their responsibilities to their children would supersede their ability to assist in an emergency evacuation. Our approach would also call for the seating in rows other than exit rows of persons whose physical or mental handicaps would not enable them to meet the functional requirements we earlier identified.

I want to stress that our approach is not a social statement; it is not a statement that is intended to demean or single out any group; it is simply our recognition that we in the FAA have a responsibility to assure that we are taking those incremental steps that will promote safety for the greatest numbers of people in the event of an aircraft emergency.

I would be pleased to describe for you in greater detail our research efforts, and our findings associated with those efforts. I have attached to my prepared statement a brief summary of our research activities and findings in this area. I can go into any of these areas in further detail should you choose.

In closing, Mr. Chairman, I want to state that I know we all share the same goal of seeking to achieve the highest levels of safety for the American traveling public, while at the same time, recognizing that our air travel system must be open and available to all travelers on a fair and equitable basis and without unlawful discrimination. The proposal I have outlined today represents, in the view of the FAA, a reasonable step toward these goals. As we proceed through the regulatory process, we will, of course, consider and incorporate, as appropriate public input. But at this point, we believe that legislation in this area is unnecessary, and the approach we are considering provides a constructive framework for dealing with this issue, and will offer a good vehicle for solicitation of public input.

That completes my prepared statement, Mr. Chairman. I would be pleased to respond to any questions you may have at this time.

MAJOR POINTS IN RESEARCH

- studies were conducted by researchers who are widely published in the open scientific literature--studies were multi-trial and were designed using accepted experimental design protocol.
- information from CAMI study of seat location was drawn from a variety of tests:
  - evaluation of individuals with handicap, where individuals moved from one of three designated seat locations to a specific exit.
  - evaluation of handicapped passengers who required assistance to move to an exit.
  - evaluation of totally incapacitated passengers.
  - evaluation of the effect of exit configuration on evacuation.
- research indicated that under circumstances where passenger cabin must be speedily evacuated, placement of the handicapped passengers becomes important.
- the average ambulatory handicapped appears to possess adequate mobility for escape. He could be seated anywhere in the cabin except in an exit row or a primary overwing exit route.
- in proceeding to exit doors from given seats handicapped persons exceeded the exit time of unimpaired people by 22 to 1,189 percent.
- persons with disabilities increased the exit time through floor level exits in all cases, ranging from 3.9 seconds to 49.8 seconds. In the case of window exits, the increases ranged from 3.4 to 42.5 seconds.
- in general, evacuation times increased as the number of handicapped subjects was increased.
- 15 actual blind subjects were used to determine amount of seat to exit time.
- the amount of time the blind subjects needed to move from seat to exit was less than that of a sighted subject who had been blindfolded, but greater than a sighted subject who was not blindfolded.
- blind persons increased evacuation times minimally, but this is only measuring seat to exit time <u>not time to open exit or to exit and go down slide</u>.
- use of canes added 1.3 seconds to flow disruption rate and could damage slides.

SUMMARY OF RESEARCH ACTIVITIES

1. "Survival in Emergency Escape from Passenger Aircraft," Doc. No. AM 70-16 (October 1970).

2. "Air Transportation of Handicapped Persons," FAA's Flight Standards Service, Project Report No. 73-740-120A (1973).

3. "Emergency Escape of Handicapped Air Travelers," Report FAA-AM 77-11, (July 1977).

4. "Considerations Relative to the Use of Canes By Blind Travelers in Air Carrier Aircraft Cabins", FAA-AM-80-12 (1980)

5. "Protection and Survival Laboratory Memorandum", No. AAM-119-87-6, November 5, 1987.

6. "Accident/Incident Bio-Medical Data Reports" maintained by the Civil Aeromedical Institute. This data bank contains over 3,300 entries. Of these, 132 pertained to problems of persons with handicaps or with characteristics that are likely to affect their ability to activate an emergency exit and to take additional actions needed to ensure safe use of that exit in an emergency.